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Radar providing great maps of Earth

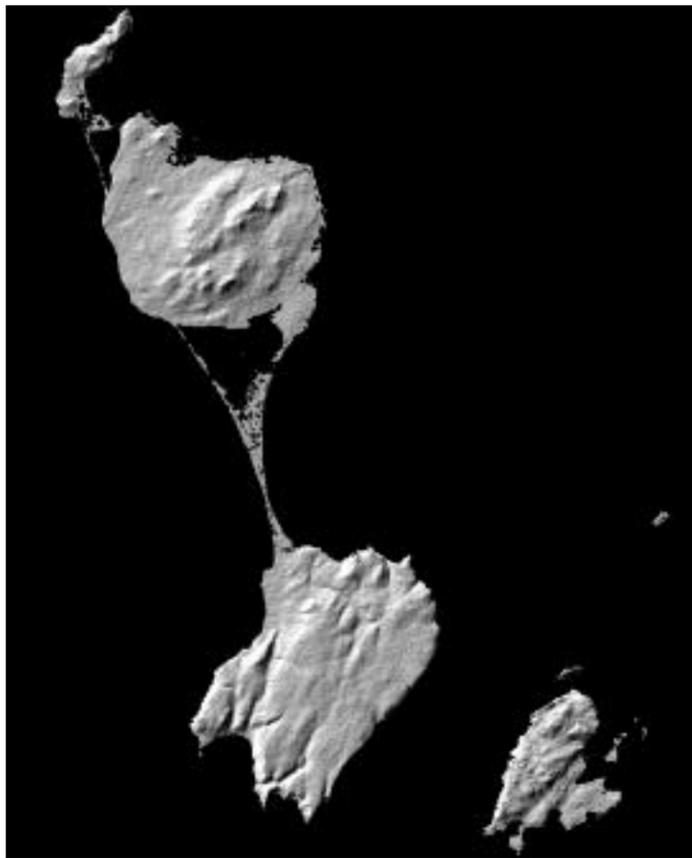
Right: A shaded relief image generated using topographic data from SRTM, acquired a few hours after the shuttle's Feb. 11 launch, shows Miquelon and Saint Pierre islands, located south of Newfoundland, Canada.

The JPL-managed Shuttle Radar Topography Mission (SRTM) is now well on the way to achieving its goal of completing the most accurate 3D map of Earth ever created.

Launched Feb. 11 at 9:43 a.m. Pacific time onboard Space Shuttle Endeavour, the mission by Wednesday afternoon, Feb. 16, had mapped 73 percent of the target area once. That exceeds the land area of the Americas, Africa and Australia combined. More than 38 percent of the target area—45 million square miles (18 million square miles) has been mapped with two or more passes. Endeavour collects data on 40,000 square miles every minute it is over land.

Mission controllers expressed optimism Wednesday that despite a problem with a small nitrogen thruster on the end of the 60-meter (200-foot) mast protruding from the cargo bay, the shuttle will have enough propellant and power to complete its planned mapping of more than 70 percent of the Earth's surface. The thruster glitch has not compromised the performance of the radar system.

New radar images of Russia's Kamchatka Peninsula and of northwestern Mongolia were released



Wednesday, following the release Tuesday afternoon of images of Brazil, South Africa and the South Island of New Zealand. Enthusiastic scientists said the picture of the Earth obtained by the mission will be used for decades to come.

The shuttle mission is scheduled

to conclude Feb. 22.

Images from SRTM are available online at <http://photojournal.jpl.nasa.gov>. For more information on the mission, go to <http://www.jpl.nasa.gov/srtm>.

Lab has critical role on NEAR asteroid orbit mission

Several teams from JPL are contributing to the first-ever spacecraft mission to orbit an asteroid.

On Feb. 14, the Near Earth Asteroid Rendezvous (NEAR) mission, managed by Johns Hopkins University's Applied Physics Laboratory, went into orbit around asteroid 433 Eros, a potato-shaped, 34-kilometer-long (21-mile) body about 256 million kilometers (160 million miles) from Earth.

JPL teams are providing critical support to the mission in these areas:

- Navigation
- Radio science (including gravity science)
- Deep Space Network tracking
- Multispectral imager and near-infrared spectrometer
- Shape modeling working group
- Mission design (in conjunction with APL)

Dr. Don Yeomans, manager of JPL's Near-Earth Objects Program Office, is radio science team chief for NEAR, which will study Eros for a year, gradually dropping its elliptical orbit to as low as 1 kilometer above the surface by mission end. Another member of the team, Jon Giorgini of the Navigation and Mission Design Section 312, said the team is involved in tracking the asteroid's rotation state and gravity field, as well as the trajectory of the spacecraft in its orbit around Eros.

The navigation team has been involved with NEAR since its inception, including determining requirements for the spacecraft and selecting the target asteroid. The team, headed by JPL's Dr. Bobby Williams, processes radiometric data through the Deep Space Network and optical data through NEAR's onboard camera.

"This mission is not only the first to orbit an asteroid, it's also the first to use landmark tracking for deep-space navigation," Williams said, noting that craters on the rock are identified and then used for points of reference.

Williams said the spacecraft's current transfer orbit will continue through about March 10, at which point it will be lowered to about 200 kilometers (125 miles).

He said NASA is considering a crash landing on Eros at the end of the mission next February, when the spacecraft will be out of fuel.

Images of Eros and other information about the mission are available online at <http://near.jhuapl.edu>.

TOPEX tracks eddies feeding marine life

By Diane Ainsworth

The Haida eddies (A, C, D) are located near the Queen Charlotte Islands in British Columbia, Canada. The Sitka eddy (B) is located off the coast of Alaska.

Some of the largest ocean eddies to form in recent years along the west coast of Alaska and Canada, bringing with them nutrients to feed a dwindling population of salmon and other marine life, are being tracked with satellite data from the joint NASA-French space agency TOPEX/Poseidon, managed by JPL.

An eddy is a water current that runs contrary to the main current. The large "Sitka" and "Haida" eddies, named for the

town of Sitka, Alaska, and the native name for the Queen Charlotte Islands, British Columbia, Canada, form along the Alaskan Panhandle and Canadian west coast each year and drift into deeper waters to the west. TOPEX/Poseidon has tracked these and other eddies since the 1992-93 winter. Years with heavy El Niño winds appear to produce particularly large eddies that can last for several years and replenish nutrient-starved regions of the ocean. Observations of the Haida Eddy by the Canadian research vessel J.P. Tully show that the eddies move fresh water, iron and nitrates from land to sea, bringing higher nutrient levels and a local resurgence of phytoplankton, the minute plant life found in bodies of water.

New measurements taken by TOPEX/Poseidon are available online at http://www.ccar.colorado.edu/~realtime/global-real-time_ssh.

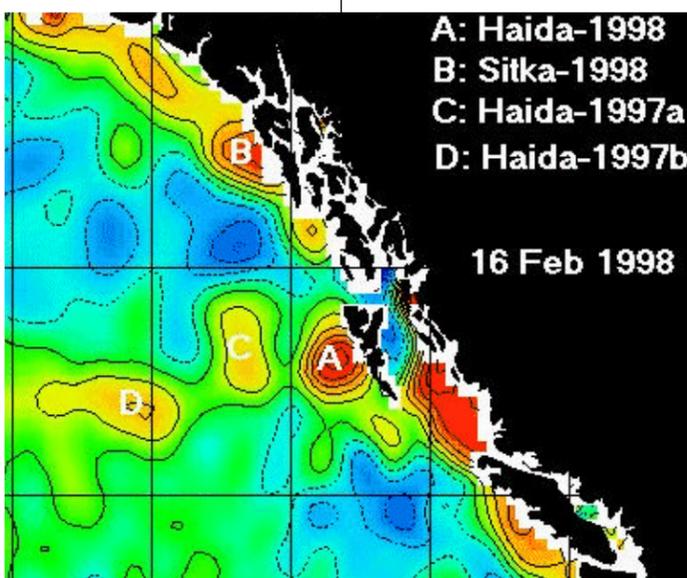
Cassini images an asteroid

New images taken by the camera onboard the Saturn-bound Cassini spacecraft are giving scientists the first size estimates on asteroid 2685 Masursky and preliminary evidence that it may have different material properties than previously believed.

"The Masursky images represent the first time that Cassini has gathered information on a body not extensively studied from Earth," said Carolyn Porco, Cassini imaging team leader and associate professor at the Lunar and Planetary Laboratory of the University of Arizona, Tucson.

The pinpoint-sized images, taken on Jan. 23, also marked the first use of Cassini's automated object-targeting capabilities, and they functioned as expected, Porco said. The two new images are available online at <http://www.jpl.nasa.gov/pictures/cassini> and <http://ciclops.lpl.arizona.edu>.

Since Masursky is too small to be measured from Earth, scientists hoped Cassini could help them determine its size, as well as its reflectivity, asteroid category, and possibly its rotation period.



News Briefs



Moshe Pniel

Pniel to lead scatterometer projects

Moshe Pniel, science project manager of Japan's recently launched Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) onboard NASA's Terra Earth-observing spacecraft, has been named manager of JPL's scatterometer projects, which measure sea surface wind speed and direction as part of NASA's Earth Observations System Program.

Current JPL scatterometer projects include the recently launched SeaWinds/Quikscat mission and the NASA SeaWinds instrument scheduled to be launched in November 2001 on the Japanese ADEOS-11 satellite.

In his new role, Pniel will lead JPL's effort to obtain a long-term, daily data set of winds at the ocean surface around the globe for weather, climate and oceanographic studies.

Since 1996, Pniel has served and will continue in his role as science project manager ASTER. Previously, Pniel was responsible for the development of ASTER's science data system, and was also responsible for developing the science data system for the Atmospheric Infrared Sounder, called AIRS, part of the second Earth Observing System satellite tentatively set for launch in December 2000.

Lew Allen Award winners honored

Three JPL scientists have been honored with the 1999 Dr. Lew Allen Award for Excellence.

The recipients are DR. JAMES BOCK of the Astrophysics Research Element 3231, DR. SON VAN NGHIEM of the Radar Science and Engineering Section 334 and DR. ADRIAN STOICA of the Avionic Equipment Section 344.



Left to right:
Drs. James Bock,
Son Van Nghiem and
Adrian Stoica

Bock received his award in recognition of his development and implementation of the low-background SPIDER bolometer arrays, whose extremely low noise characteristics and large array sizes enable a significant step forward in submillimeter astronomy.

Nghiem was recognized for his pioneering research in the areas of polarimetric scatterometry for Earth science remote sensing investigations and contributions to future spaceborne advanced instrument concepts.

Stoica was cited in recognition of his leadership in the area of evolvable hardware and for creating a world-class re-search center in this rapidly emerging field.

The annual awards—established in 1990 in honor of Allen, who served as JPL's director from 1982-90—recognize and encourage significant individual accomplishments or leadership in scientific research or technological innovation by JPL employees during the early years of their professional careers.

The winners received a wall plaque and a grant of \$25,000 from the Director's Research and Development Fund, which is used at JPL to enhance the awardees' professional efforts

Dumas starts library story series

Deputy Director LARRY DUMAS will kick off the JPL Library's "JPL Stories" series Feb. 24 with a talk titled, "Things to Keep."

The discussion will focus on the fact that while JPL continues to emphasize problem solving and things that need to change, the Lab may lose sight of some important parts of its culture that don't need changing.

The discussion will also note that preeminence in space exploration is not an accident of history, but the results of attitudes, habits and work ethics of JPL staff that lead to success.

Dumas' talk will be held from 4 to 5 pm in the library's customer service area at the west end of Building 111. Seating is limited to the first 40 attendees.

Biology course coming up

JPL's Education and Training Consortium will host a special course next month designed to increase employees' understanding of biology and how it relates to NASA's and JPL's missions.

"Essentials of Biology," taught by specialists in space biology and science education, will be offered March 2 and 3 in von Karman Auditorium. The class will be taught in two 3-1/2-hour sessions and attendees may select a morning or afternoon session from each day. The multimedia presentation will include video, slides and other presentations, and attendees may ask questions and interact with the presenters throughout the course. A supplemental resource guide will be provided to each participant.

Topics range from the origins of life through the structure and function of the living cell, to the systems which make up the human body, to the principles of integrated Earth science. The presentations are designed for those with little or no background in the area, but also illustrate cutting-edge research and technology for those with special interest or expertise.

Instructors include DR. GARY COULTER, professor of microbiology at Colorado State University and former program manager in NASA's Life Sciences Division, and DR. JOHN RUMMEL, NASA planetary protection officer and associate program scientist with NASA's Gravitational Biology and Ecology Program.

Online registration for the course is available at <http://hr/et>.

Panel to discuss Black History Month

In celebration of Black History Month, JPL's African American Resource Team will present a panel discussion titled, "History, The Status of African Americans and Challenges" on Feb. 28 at 1 p.m. in the Building 167 conference room.

Panelists will be DELANO YARBROUGH, president of the National Association for the Advancement of Colored People's Pasadena branch; ISAAC GILLAM, program director, Pasadena operations, Honeywell; and LEE BROWNE, Caltech lecturer in education, emeritus.

RSVPs are requested to TOM MAY at ext. 4-2121 or by e-mail.

For the second straight year, Troy High School of Fullerton has won the regional competition of the National Science Bowl, held at JPL.

Troy defeated 21 teams from Los Angeles and Orange Counties on Feb. 12, and will go on to represent JPL in national competition this spring.

Modeled after the "College Bowl" television show of the 1960s, the National Science Bowl was first organized by the U.S. Department of Energy in 1991.

The competition started with a round-robin event in which every team—represented by four students and one alternate—played five rounds, followed by a double-elimination tournament for the top eight teams. Competitors answered questions on biology, chemistry, physics, astronomy, Earth science, computer science and mathematics.

The Troy team and its coach, Kurt Wahl, will go on to the nationals in the spring at the 4-H Center near Washington, D.C., all expenses paid.

Troy High wins second straight Science Bowl

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meeting at 11:30 a.m. Mondays, Tuesdays, Thursdays (women only) and Fridays. Call Occupational Health Services at ext. 4-3319.

Codependents Anonymous—Meets at noon every Wednesday. Call Occupational Health Services at ext. 4-3319.

Gay, Lesbian and Bisexual Support Group—Meets the first and third Fridays of the month at noon in Building 111-117. Call employee assistance counselor Cynthia Cooper at ext. 4-3680 or Randy Herrera at ext. 3-0664.

Parent Support Group—Meets the third Thursday of the month at noon in Building 167-111. Call Greg Hickey at ext. 4-0776.

Senior Caregivers Support Group—Meets the second and fourth Wednesdays of the month at 6:30 p.m. at the Senior Care Network, 837 S. Fair Oaks Ave., Pasadena, conference room #1. Call (626) 397-3110.

Friday, February 18

Von Kármán Lecture Series—Caltech President Dr. David Baltimore will present "AIDS Vaccine—Finding the Cure" at 7 p.m. in The Forum at Pasadena City College, 1570 E. Colorado Blvd. Open to the public.

Fri., Feb. 18—Sun., Feb. 20

The Merchant of Venice—Shakespeare's comedy will be presented in Caltech's Ramo Auditorium Friday and Saturday at 7:30 p.m., Sunday at 2 p.m. Admission is to be determined. Call (626) 395-4652.

Monday, February 21

Caltech Ballroom Dance Club—The second lesson of a four-week course of professionally taught Viennese waltz will be offered at 7:30 p.m. in Winnett Lounge. Course cost is \$24. Call Don at (626) 791-3103.

Tuesday, February 22

Credit Union Annual Meeting—To be held at Caltech's Beckman Auditorium. Refreshments will be served at 4:45 p.m., with the meeting to begin at 5:30. Credit union members in attendance will be eligible for prizes. Also open to nonmembers.

Wednesday, February 23

Caltech Ballroom Dance Club—The third lesson of a five-week course of student-taught Argentine tango will be offered at 7:30 p.m. in Winnett Lounge. Cost is \$1 per lesson. Call Don at (626) 791-3103.

JPL Toastmasters Club—Meeting at 5:30 p.m. in the Building 167 conference room. Guests welcome. Call Mary Sue O'Brien at ext. 4-5090.

Wed., Feb. 23—Fri., Feb. 25

AVIRIS Workshop—The Airborne Visible Infrared Imaging Spectrometer project will host the event in von Kármán Auditorium. More than 250 people from all over the world have already registered for presentations and discussion on the application of this technology to research in geology, ecology, hydrology and atmospheric studies. More than 70 papers have been accepted for presentation. Information on the workshop, including a preliminary agenda, can be found online at <http://makalu.jpl.nasa.gov/html/workshop2000.html>.

Thursday, February 24

Caltech Architectural Tour—The Caltech Women's Club presents this free service, which is open to the public. The tour begins at 11 a.m.

and lasts about 1 1/2 hours. Meet at the Athenaeum front hall, 551 S. Hill, Pasadena. Call Susan Lee at (626) 395-6327.

JPL Golf Club—Meeting at noon in Building 306-302.

JPL Hiking Club—Meeting at noon in Building 303-209. Guest speaker Bob Herman will discuss a walk through the garment and financial districts of downtown Los Angeles scheduled for Saturday, Feb. 26.

Fri., Feb. 25—Sat., Feb. 26

Winter Concert—The Caltech men's and women's glee clubs will perform at 8 p.m. in Dabney Lounge. Program is to be determined. Admission is free. Call (626) 395-4652.

Fri., Feb. 25—Sun., Feb. 27

The Merchant of Venice—Shakespeare's comedy will be presented in Caltech's Ramo Auditorium Friday and Saturday at 7:30 p.m., Sunday at 2 p.m. Admission is to be determined. Call (626) 395-4652.

Saturday, February 26

African Dance—Soweto Street Beat Dance Theatre, combining African contemporary, neo-African, modern African, Afro-fusion and new traditional dance, will perform at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$25, \$21 and \$17. Call (626) 395-4652.

Monday, February 28

Caltech Ballroom Dance Club—The third lesson of a four-week course of professionally taught Viennese waltz will be offered at 7:30 p.m. in Winnett Lounge. Course cost is \$24. Call Don at (626) 791-3103.

Tuesday, February 29

Caltech-Occidental Symphony Orchestra—A program to be determined will be performed at 8 p.m. in Caltech's Ramo Auditorium. Admission is free. Call (626) 395-4652.

Wednesday, March 1

Associated Retirees of JPL/Caltech Board—Meeting at 10 a.m. at the Caltech Credit Union, 528 Foothill Blvd., La Cañada.

Caltech Ballroom Dance Club—The fourth lesson of a five-week course of student-taught Argentine tango will be offered at 7:30 p.m. in Winnett Lounge. Cost: \$1 per lesson. Call Don at (626) 791-3103.

Thursday, March 2

JPL Gun Club—Meeting at noon in Building 183-328.

Friday, March 3

JPL Softball Organizational Meeting—An organizational meeting will be held at 11:30 a.m. in the Building 167 conference room. All team managers and interested individual players not currently affiliated with a team should attend. Call Scott Morgan at ext. 4-4972 or Rich Benesh at ext. 4-3748.

Puerto Rico—This travel film will be presented at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$9 and \$7. Call (626) 395-4652.

Saturday, March 4

Dreams of Martha Stewart—This funny, sometimes sad, one-woman play about the eternal quest for perfection will be presented at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$25, \$18 and \$14. Call (626) 395-4652.

SPACE SCIENCE GETS A BOOST

NASA Associate Administrator
Ed Weiler addresses Lab



Bob Brown/JPL Photo

Dr. Ed Weiler, NASA's associate administrator for space science, delivered a talk to JPL staff on Feb. 10, discussing recovering from failures, the positive news for the agency and JPL in the president's fiscal year 2001 NASA budget request, and prospects for the future in space science.

Following are excerpts of Weiler's address.

On the Mars losses and dealing with adversity

We've had a couple of failures in the Mars Program. Since I have some direct personal experience about adversity, I actually do feel your pain and share it.

By 1990 I had spent 12 years of my career working on the Hubble Space Telescope as chief scientist. There was a heck of a lot of hype before the Hubble launch. We were on top of the world. Everybody wanted to get on that bandwagon, because it was fun.

Then on June 28, 1990, we had to go in front of the public and tell them that Hubble had a spherical aberration, that the mirror was screwed up. It was amazing how many people who were so-called experts at the launch now disappeared. I'll never forget that experience.

But we found a way to fix it, with an instrument from right here at JPL, the Wide Field Planetary Camera 2. A week before that press conference, John Trauger [WFPC-2 project scientist] told me we can fix it, and at the press conference I said, "We will fix it, on cost and on schedule, before the end of 1993." Of course, nobody in the world believed us. It was too much fun beating up on NASA.

You really feel alone at that point. (It) affected me both personally and professionally. I asked myself, "Why am I working at NASA?" I could probably do better in industry or in university life. But the reason I stayed, and the reason I hope every person on the Mars Program and in space science stays, is that we do it because we're dedicated to this job.

Think of your life in terms of a 100-yard football field. If you're lucky enough to live 100 years, your lifespan goes not to the 1 yard line, but to the 1 micron line. So, yes, you could leave JPL and I could leave NASA [for a more lucrative career], or you can continue doing the impossible.

I'm convinced that sometime in the next 100 years, maybe in the next 20 years, maybe even less, we at NASA and JPL are going to do the mission that proves life existed somewhere [other than Earth], sometime in the universe.

What will be remembered 1,000 years from now? Ten thousand years from now? A million years from now? Your swimming pool and Mercedes? Or the fact that you worked on something that will last for all of human history?

The end of the Hubble story is that WFPC-2 was a total success, and brought Hubble back to prominence. I maintain that when you say Hubble, 95 percent of the people in the country know what it is and they associate it with

success. We'll be there in the planetary program very soon. This period of time too shall end.

Key points on the NASA budget request for 2001

The good news is we got more money this year.

Comparing it to what I expected, over five years, the president's request is \$1.7 billion over and above our current budget. That is the single biggest increase in the history of the Office of Space Science.

What's not well reported is that despite this major increase in NASA funding and increases in other agencies, the '01 budget still has a \$163 billion surplus in it. In addition, with all this increased federal spending, the percentage of government-funded programs versus the gross national product is the lowest since 1963.

By 2005, if this budget is approved, the Office of Space Science will be up to \$3.5 billion. For the first time in a long time, Office of Space Science funding will surpass that of the space station. Also, looking out to '03 and '04, space science funding will surpass funding for the space shuttle program for the first time.

The Mars Program

The Mars Surveyor Program received an increase of about \$300 million, (which is) quite a vote of confidence from the White House and the Office of Management and Budget (OMB). Now we've got to deliver on it. Instead of getting punished for the problems we've had, we've been told, "We still love you," so to speak, and "We trust you to solve your problems, and get on with the program we've always wanted."

The OMB really supports the Mars Program, but they want to see a long-term vision. The emphasis is on "sustained presence," to build a telecommunications infrastructure, enhance science micromissions and technology development for many future concepts.

New Discovery Program initiative

The Discovery Micromissions will be analogous to the Small Explorer Missions series. They will take advantage of the multimission bus Charles Elachi's group is developing for the Mars Network concept. The theory is we build one multimission bus that could then be copied for fewer dollars, hopefully, in the future. These small buses could be used to take science experiments to Mars, Venus or other local inner solar system targets. These missions would be done competitively and be driven by science.

On the New Millennium Program

This is something I'm very proud of, and I fought very hard for it. As of last year, the New Millennium Program was cancelled because it was being used as a science program, not a technology program, as far as the OMB was concerned.

With the help of people here, Fuk Li in particular, we came up with a different way of managing it, a different emphasis, basically what we promised five years ago, and selected the Space Technology 5 mission along those lines. The OMB likes what we're doing and put back every single dollar.

There is a future now beyond Space Technology 5. We will compete New Millennium mission ideas among the centers. We'll select three or four for phase A, then down-select one to go into phase B. After phase B, if there's one ounce or one watt left for science, we'll consider it.

But science will not be a driver, and it will be the first thing taken off. That's hard for me to say as a scientist, but the message is very clear: we've got to stay on the straight and narrow path. The fact that they canceled it shows us they weren't kidding.

On Mars technology development

We have an X2000 program for technology for the outer planets; it may be time to think about whether we need a Mars technology program. That would lead to some of the impossible things we're trying to do early; maybe we should take a little longer and do them right, but later. The way you do that is with technology.

On Mars architecture

(Currently), we "come up to bat" to launch missions every two years; the OMB uses an analogy that "you better hit home runs." However, (let's say) you go every two years instead with a big orbiter and 15 probes. If 10 out of 15 of them are successful, that's a .750 batting average, and that's not bad.

It's something to think about. What I'm doing and what OMB is doing is questioning the whole premise of our previous architecture. Maybe there's room for a middle ground.

On program funding

Perhaps the community could be a little more innovative . . . look across the program and say one field is more important than another so we can get more money into that up and coming field. Some fields go through periods where they're not as interesting as they used to be. We're not supposed to be the Social Security for the program.

"Over five years, the president's request is \$1.7 billion over and above our current budget. That is the single biggest increase in the history of the Office of Space Science."

— Dr. Ed Weiler,
NASA associate administrator,
Office of Space Science

"The OMB really supports the Mars Program, but they want to see a long-term vision. The emphasis is on "sustained presence," to build a telecommunications infrastructure, enhance science micromissions and technology development for many future concepts."



Service Awards

The following employees were fourth quarter 1999 recipients of Service Awards for 20 or more years of employment.

5 years:
rd Mathison.

25 years: Yvonne Barraza, John Elias, Jack Patzold, Joachim Voeltz.

30 years: James Anderson, Richard

Aragon, Kenneth Atkins, Kerry Erickson, Dorothe Horrtor, Michael Klein, Donald Langford, Irma Lopez, Helmut Partma, Ronald Saunders, P. Shakkottai, Joel Smith, John Stagner, Richard Stanton, Yi-Chien Wu.

25 years: Robert E. Brown, Glenn Campbell, Cynthia Chinn, Judith Cohen, Hamil Cooper, James Cutts, Patrick Dillon, Donald Gray, Steve Kuan, Dennis Matson, Helen Paley, Daina Parlee, George Resch, Michele Sawnor, Anita Sohus, Ben Toyoshima, Roger Williams, Joyce Wolf, Chialin Wu.

Van Wickle, Kenneth Vines, Patricia Westerlund, Andre Yavrouian, Carol Young, Peter Young, Christopher Yung, Samuel Zingales.

NOVA Awards

The following employees were awarded JPL's Notable Organizational Value-Added (NOVA) awards in January:

Section 346: Marc Foote.
Section 385: Daniel Peters.
Section 387: Betina Pavri.

Passings

EVELYN DIMETRAL, 78, a retired administrative secretary in Section 641, died of pneumonia Jan. 3. Dimetral worked at JPL from 1961-86. She is survived by daughters Ixchel Maerker and Diana Poole. Services were private.

ARTHUR PRISK, 75, a retired senior technical assistant in Section 358, died of respiratory failure Jan. 8 at his home in Tumwater, Wash. Prisk joined the Lab in 1967 and retired in 1990. He is survived by his wife, Jeanne; three sons, one daughter, one grandchild and three great grandchildren. Burial was at Tahoma Memorial Veterans Cemetery in Washington state.

GEORGE ALAHUZOS, 69, a senior technical engineering assistant in Section 344, died of heart failure Jan. 24 at his home in Sierra Madre.



George Alahuzos

Alahuzos had worked at JPL since 1952. He is survived by son Michael and daughter Shawn Spencer. Memorial services were held Jan. 26 at Cabot & Sons in Pasadena.

BRAD GIBSON, 42, chief mechanical systems engineer for the Pluto/Kuiper Express mission, died of a heart attack Jan. 10.



Brad Gibson

Gibson, who had worked at the Lab since 1983, previously served as project element manager for mechanical systems for the X2000/Champollion group and as supervisor of that group. He was also the configuration lead for Pluto/Kuiper Express. He is survived by his wife, Lisa, and children Eric, Kyle and Marissa. Services were held at Fair Haven Memorial Cemetery in Santa Ana.

Letters

I'd like to express my thanks for all the encouragement I've received from my fellow JPLers on the recent death of my father-in-law. Thanks as well to the ERC for the lovely plant.

Alan Mazer

My family and I would like to thank my co-workers and friends in Section 344 for the expressions of sympathy following the loss of my mother and also for the lovely plant. Thanks to the ERC for the beautiful plant.

Thea Byrd

I wish to thank all of our kind friends at JPL for their support during the illness and subsequent death of my wife, Nobuko. Nobuko touched many people's lives, especially in the area of Japanese-American culture, martial arts and education. We had many people from those organizations represented at her funeral. But what was truly impressive was the overwhelming love and caring that we received from our friends at JPL. The Awaya family wishes to give special thanks to The Thermal and Propulsion Section 353, some life-long family

friends in Division 34, and very close friends in other parts of Division 35.

Henry Awaya and daughters Anne and Elizabeth

The support I have received from the JPL community has been gracious and comforting. My mother's passing has been difficult emotionally. Thanks to the ST3 project and other friends who sent flowers to the services in Oklahoma. There were a bulwark of encouragement. Thanks, too, for the plant from the ERC.

Donna Nigh Jones

Everyone in Section 352 who knew Brad Gibson enjoyed working with him because of his excellent engineering skills and his exceptional ability to work with diverse groups of people. Brad was always willing to help wherever he was needed and with each assignment he became more widely known for his talents. He always remained calm even during the toughest and most challenging times. Brad's passing is a tremendous loss to all of us who worked with him, not only on a work level but on a personal level. All of were aware of Brad's dedication to his work, his church and his family.

Section 352

Classifieds

For Sale

ANSWERING MACHINE, GE, black, microcass., voice time/day stamp, hardly used, 626/844-4383.
ANTIQUES, dresser, ash w/tall mirror, \$300; wash stand, marble-top w/hand-painted tiles, \$275; clothes wringer & stand, \$150; wall clock, Westminster chimes, needs work, \$50; radio speaker table, walnut, \$75; beer tray collection & misc. fans and radios, make offer. 790-1279, after Feb. 22.
AQUARIUMS, 2 ea. 45 gal., pine stands, 2 ea. 20gal, 1 ea. 10gal, & 1 ea. 5 gal., misc. equip. 310-364-0125, Tim.
COFFEE TABLE w/4 beveled glass sides, round, copper top, \$50. 909/590-9233.
COMPUTER, 166 MHz Pentium, 32 MB RAM, Trident SVGA, 1.5 GB hard drive, 56K modem, \$295. 626/797-3310, eves & weekends.
DESK, computer, Sauder, dark cherry, 35.5 x 19.5 x 29.5"H, keyboard tray, printer shelf, hidden whis, 1 yr. old, exc. cond., \$120 new at Staples, sell \$80/obo. 805/388-8524, Trish, eves.
KIMONOS & OBI, antique silk & other fabrics from Texuba, incl. hard-to-find shibori & eikat, from \$35 to \$150. 730-7472.
LEADED GLASS INSERTS for coffee & end table, 4 ea., 20" x 24" w/14" x 18" beveled glass, \$10 ea. 626/303-1927.
MISC, shelf, wall-mounted, Ethan Allen, cherry wood, exc. cond., \$35; comforter, Fieldcrest, dust ruffle, pillow sham set, full sz., exc. cond., \$30; steam iron, GE Power Spray, vg cond., \$15; floor lamp, black base & pole, off-white shade, gd. cond., \$12. 626/577-8107.
MISC, camera, Sony Mavica digital, 10X zoom, \$369; turntable, Techniques, \$29; filter syst for aquarium, new, pd \$35, sell \$9; satellite signal booster, \$8; sharing device, Belkin 4 to 1, peripheral, gold IEEE cable, \$49, orig. \$99; Multimedia Bible or Photostudio s/w, \$9. 366-6134.
PIANO, beautiful, medium oak, Wurilizer, match. bench, console model, full keyboard, appx. 13 yrs. old, new cost \$6,000, \$1,850/firm. 805/527-7017.
PRINTER, color, Lexmark 1100 w/orig. ink cartridge over half full, \$65/obo. 626/254-1550.
PUPPIES, lovable German Shepherd, 8 wks. old, has shots & papers, healthy, wants loving & caring family, \$400. 626/614-9060.
RANGE, Whirlpool, gas, almond, 30" self-clean oven, like new, must see, W. Covina, \$350.00. 626/337-6130, days.
REFRIGERATOR, Amana, white, 21 cf, top freezer, model TP121A3W, dual humidity ctrl., ice maker, deli chiller ctrl., exc. cond., must see, \$300/obo. 626/568-8298.
REFRIG./FREEZER, Kenmore side-by-side, ice & water dispenser, almond, like new, \$375; mountain bikes, 2 ea., collapsible 26", can stow in trunk, \$70 ea; storage cabinets, 2 ea., metal w/shelves, 6 x 3 x 1.5", \$25 ea. 790-1279, after Feb. 22.
ROAD BIKE, mens 25" Schwinn Le Tour, VG cond., except leather seat is dried out, \$150/OBO. 248-9432, Stan.
SAW, Craftsman 10" radial arm w/3-drawer cabinet base on rollers, new table hardware, \$400. 626/303-1927.
SOFA, 90" x 36", dark green plaid, hardwood trim, 3 cushions, 2 pillows, exc. cond., \$250. 626/358-0443.
SKI SETS, made in Austria, Blizzard, high quality, model Mid-Sport 550, sz. 190 w/salomon S727 binding, brand new, incl. boots, top quality, made in Italy, Nordica model stratus w/air pump for ankle support, sz. 10, brand new, plus hvy. duty storage bag, paid \$695, sell \$195; made in Austria, Kastle, high

quality, model Master, sz. 170 w/Salomon S626 binding, brand new, incl. boots, top quality, made in Italy, Nordica, ladies sz. 7-8, brand new, plus hvy. duty storage bag, paid \$390, sell \$135. 626/395-8039.
SKI EQUIPMENT, KZ CVC competition slalom skis, 165 w/Marker M18 bindings & matching 46" poles, Nordica Next 87 boots, Nordica pants, sz. 30, all for \$125/obo. 626/449-7895.
SKI RACE CAMP certificate at Mammoth, 3 days, March 20-22, incl. 6 hrs. coaching each day, video analysis, 1 day high performance demos, equipment & tuning session, opportunity to win some equipment; \$350 value, sell \$225. 790-1209.
VACUUM CLEANER, Eureka Bravo, upright 9000 series, wand attach., full tool pack, \$30; VCR, Fisher FVH-4000, VHS format, remote & manual, exc. second machine, works great, \$25; car cover, original MG Mitten, designed for Mazda RX7, will work for similar vehicle such as Miata, Z3, etc., \$30. 626/355-7086.

STORAGE SHED, appx. 6 x 6', will remove. 626/797-1673.
TANK, 20 gal., for terrarium & incubator for turtle eggs. 626/969-6938, Mary.
VOLLEYBALL PLAYERS, coed, all levels of play, Tues. nts., 8-10, Eagle Rock High School, \$3/nt. 956-1744, Barbara.

Vehicles / Accessories

'95 ACURA Legend LS coupe, 2D, black, auto, 104,000 mi., mint cond., leather, sunroof, heated seats, alloy wheels, CD changer, remote keyless entry, 17,000/obo. 626/584-3204 day, 909/592-0780 eve/weekend.
'97 CHEVROLET Astro van, 8 psgrs., Autumn-Wood, LS, rear air, CD player, alarm, Lojak, class 3 hitch, towing pkg., clean, well-maint., 52K mi., ext. warr., \$15,500. 891-6836, Steve.
'96 CHEVROLET Cavalier, 4 cyl., 4 dr., green, auto, a/c, CD player, cruise, p/d, ABS, 79K, \$5,000/obo. 626/792-3694, Brian.
'94 CEVROLET Astro LT mini van, pwr. everything, class 3 hitch, running boards, roof rack, 4 captains seat + 1 bench seat, CD player, super cond. inside & out, 90K mi., \$11,000/obo. 952-3113, Jeff.
'84 CHEVROLET Silverado, 3/4 ton, rack, am/fm, PW, PDL, runs good, great family truck, \$3,200/OBO. 957-8463.
'88 DODGE Aries, 120K mi., 4 dr., a/c, new front struts, runs well, \$1,500/obo. 626/797-6982.
'81 FIAT Pininfarina Spider 2000, black w/tan top, good shape, good engine, \$2,800/obo. 323/225-1732.
'81 FIAT Spider 2000, 5 spd., 56K orig. mi., new brakes/top/tires/belts/hoses, good cond., runs well, \$2,200. 626/799-2484.
'94 FORD Ranger, XTL, 5 spd., camper shell, bedliner, below blue bk., \$6,800/obo. 790-3854.
'97 JEEP Wrangler SE, red, 4WD, P/S, P/B, air bags, Kenwood stereo/cass., sound bar, Lo-Jack, ignition cut-off, 31" x 10.5" tires, alloy rims, 25K mi., under transf. arr., exc. cond., \$14,900/obo. 248-8103, Mike.
'95 HONDA Prelude, blue, 65,400 mi., \$10,500/obo. 805/523-7246.
'93 HONDA Civic Coupe EX, white w/neutral interior, very nice looking, perfect mechanical cond., 5 speed, A/C, cruise, alarm, keyless entry, pwr. win./locks, sunroof, great stereo, 73K mi., well maintained, complete records, \$9,500. 626/284-9424.
'91 HONDA Prelude, 2.0 SI, auto, am/fm/cass., a/c, sunroof, 122 mi., very clean, \$5,900/obo. 848-7445.
'96 NISSAN Sentra GLE Deluxe, p/s, p/b, a/c, sunroof, exc., cond., low mileage, \$10,500. 760/253-7675.
'92 NISSAN Maxima V6, 113K mi., tan/beige, very reliable, runs like a top. 626/286-8530, Marcus or Bonnie.
'92 NISSAN Pathfinder XE, auto, very low miles 50,000, mint cond., fully loaded, cc, step bar, tint. win., premium stereo, complete serv. records, metallic burgundy, great looking SUV, \$10,300/obo. 626/443-9774.
'99 SUZUKI RM125, fresh top and bottom end, FMF works engine & suspension, FMF fatty pipe & silencer, 2 extra pipes, Excel rims & spokes, \$3,600. 760/253-7675.
'97 TOYOTA 4Runner, DesertDune color, 2WD 35K mi., exc. cond. AT, a/c, fm/am/cass., cc, power/s/w/d, privacy glass, running boards, \$18,500/obo. 310/207-5771, Felix.
'96 TOYOTA 4WD truck, extra cab, pwr. pkg., cc, am/fm/cass/cd, a/c, auto, shell w/carpet kit, recent tires/timing belt, all records, exc. cond., 75K mi., \$16,750. 909/596-9007.
'91 TOYOTA pickup, std. bed, 5 spd., 4 cyl., exc. cond., am/fm/cass., bedliner, many extras, rebuilt engine still under warr., orig. owner w/maint. records, \$4,400/obo. 909/865-8782.
'85 TOYOTA Celica Supra liftback 3D, auto, a/c, pwr. win/steer/dr. locks, tilt wheel, cc, am/fm stereo/cass., sunroof, alloy wheels, 138,000 mi., \$3,000/obo. 323/726-0688.
'82 TOYOTA Celica Supra, auto, new battery, am/fm/cass., good running cond., \$1,200. 213/389-3123.
'91 VOLKSWAGEN Jetta, white, 4 dr., auto, Wolfsburg ed., a/c, upgraded Pioneer speakers, Sony pull-out cass/am/fm, 149K mi., exc. cond. & super-clean, \$3,500/obo. 714/903-8888.
'76 VOLKSWAGEN bus, bubble top, camper option, exc. cond., new shocks & window seals, \$3,900. 626/799-2484.

Wanted

CLIMBING STRUCTURE or slide, plastic outdoor climbing/play structure for toddler. 626/256-6606.
DRUMMER, melodic, hard rock, good meter a must. 949-0349, Jeff.
GARDEN SHEPHERD. 626/584-9632.
HOUSEKEEPER/BABYSITTER, 3-4 days/wk., 24-36 hrs., driving, Eng. a must. 790-4594, Indu.
SEWING MACHINE, operable, \$80 max. 626/345-0681.
SPACE INFORMATION/memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman.

STORAGE SHED, appx. 6 x 6', will remove. 626/797-1673.
TANK, 20 gal., for terrarium & incubator for turtle eggs. 626/969-6938, Mary.
VOLLEYBALL PLAYERS, coed, all levels of play, Tues. nts., 8-10, Eagle Rock High School, \$3/nt. 956-1744, Barbara.

Lost & Found

LOST, Silver Montblanc pen, may have been dropped in 167 conf. rm. or Visitors Center, reward, sentimental value. Ext. 4-2741.

For Rent

EAST PASADENA house, 2 bd., 1 ba., 1 car garage, 1 carport, lg. front. yd. w/ fruit trees, incl. gardener/water/trash, non-smoker, carpet, blinds, stove, f/p, \$1,050, \$1,050 sec. dep. 1 yr. lease. 949/643-9439.
LA CRESCENTA home, pool, 2 bd., 1 ba. stove, f/p, indr. laundry hookups, very quiet, \$1,400. 790-7904.
LA CRESCENTA, 1 bd. duplex, front unit w/yd., water & gardener paid, common rms. furn., AC/Heat, washer/dryer, own phone line, 6 mi./JPL, no smoking/pets, male preferred, \$400 + 1/2 util. 248-8103, Mike.
MONROVIA, 1 bd., private ba., in 5 bd. house, 12 mi. from JPL, full privileges, no smoke/ pets, utilities incl., \$400. 626/358-7728.
PASADENA, commuter special, 1 bd. 1 ba. in 2 bd., 2 ba. luxury apt. complex, part time, sec. entr., near shopping mall, c/a/h, pool, Jacuzzi, 2 nights/wk. min., \$25/night. 626/796-5046.
SOUTH PASADENA, fully furnished studio apt., nice area at 1718 Huntington Dr., btwn. Marengo & Milan Sts., car space, laundry facilities, util. pd., no smoker/pets, \$565. 626/792-9053, Marilyn.
TUJUNGA townhouse, quiet gated commun., 3 bd., 2.5 ba. 3 level, 1,600 sq. ft., lg. liv. & din. rm., lg. bds., atch. 2-car gar., pool/spa/BBQ, avail. Mar. 15, \$1,200. 626/296-7003 days, 353-0529 eves.

Real Estate

LA CANADA, walk to JPL, 3 bd., 2 ba., family rm., views, private, immaculate, updated, 2,162 sq. ft., \$540,000, apt. 790-3508.
SAN DIMAS immaculate house built '88 in quiet & secluded Via Verde, approx. 2,600 sq. ft., 4 bd., 3 ba., lg. master bd. w/private ba., 2 tiled fireplaces, security sys., 3-car garage, marble floors, c/h/a, huge landscaped backyard. w/auto. sprinklers, lg. Spanish fountain, BBQ area, palm/fruit trees, covered patio, brick pathways/walls, \$469,500. 626/584-3204 days, orig. owner 909/592-0780, eve/weekend.

Vacation Rentals

BIG BEAR cabin, quiet wooded area near village, 2 bd., sleeps 8, F/P, TV, VCP, completely furn., \$75/nt. 249-8515.
BIG BEAR LAKE cabin, nr. ski area, lake, shops, village, forest, 2 bd., sleeps up to 6, f/p, TV, VCR, phone, microwave, BBQ & more, JPL disc. from \$65/nt. 909/210-9182.
BIG BEAR LAKEFRONT, lux. townhome, tennis, indoor pool/spa, near skiing, beaut. master bd. suite, sleeps 6. 949/786-6548.
CAMBRIA ocean front house, sleeps up to 4, exc. view. 248-8853.
LAKE TAHOE, west shore @ Homewood, close to northern ski areas: Squaw, Alpine Meadows, Homewood, etc., 3 bd. + loft, 2 ba., slps. 8, linens provided, full kitch. & laundry, TV/VCR, wood stove, wood provided, 2 day min., JPL disc., \$75 cleaning fee. 626/585-0321, Bob or Nicole.
HAWAII, Kona, on 166 feet of ocean front on Keauhou Bay, priv. house & guest house, comfortably sleep 6, 3 bd., 2 ba., rustic, relaxing & beautiful, swim, snorkel, fish, spectac. views, near restaur., golf courses, other attractions. 626/584-9632.
HAWAII, Maui condo, NW coast, on beach w/ocean vw., 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, microw., dishwasher, pool, priv. lanai, slps. 4, 4-15-12/14 rate \$95/nite/2, 12/15-4/14 rate \$110/nite/2, \$10/nite add'l. person. 949/348-8047.
MAMMOTH, Chamonix condo, at lifts 7, 8, 16, 17; walk to Warming Hut, 2 bd., 2 full ba., slps 6, fully equip. elec. kitch. w/microw. & extras, f/p & wood, color TV, VCR, cable, FM stereo, o/d Jacz, sauna, game, rec. & laundry rms; conve-nient to shops, lifts; special midwk rates. 249-8524.
MAMMOTH condo, studio + loft, 2 ba., fireplace w/wood, Jacuzzi, sauna, game rm., color TV w/cable & VCR, full kitch. w/microwave, terrace, view, amen. 714/870-1872.
MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, sleeps 6-8, fully equipped kit. incl. mcrow., D/W, cable TV, VCR, phone, balcony w/view to mtns., Jacuzzi, sauna, streams, fishponds, close to Mammoth Creek, JPL discount. 626/798-9222 or 626/794-0455.
OCEANSIDE, on the sand, charming 1-bd. condo, panoramic view, walk to pier & harbor, pool/spa, game rm., sleeps 4. 949/786-6548.
SOUTH LAKE TAHOE KEYS waterfront, 4 bd., 3 ba., 1 bd. & liv. rm. upstairs, hcp. access fair, slps. 12+, fireplaces, decks, priv. dock & ski lifts, gourmet kitch., bikes, boats, 4 color TVs, VCR, stereo w/tape & disk, pools, hot tub & beach, tennis, 10 min./skiing/casinos/golf; 1 hr./wine country, 3-day min., \$1,195/wk. high season [1 June to 15 Sept; 22 Nov to 1 April], \$595/week low seas., + \$90 cleaning fee. 949/515-5812.

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Ads must be submitted on ad cards, available at the ERC and the Universe office, Bldg. 186-118, or via e-mail to universe@jpl.nasa.gov.

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